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MYOCARDIAL ISCHEMIA AND INFARCTION

EFFECT OF HEPARIN ADMINISTRATION ON METABOLOMIC PROFILES FROM SAMPLES OBTAINED DURING CARDIAC CATHETERIZATION

ACC Poster Contributions

Ernest N. Morial Convention Center, Hall F

Monday, April 04, 2011, 3:30 p.m.-4:45 p.m.

Session Title: Stable Ischemic Syndrome: Thrombosis and other Markers

Abstract Category: 5. Stable Ischemic Syndrome

Session-Poster Board Number: 1181-320

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Background: Metabolomic profiling holds promise for early detection of coronary artery disease and in assessing risk for ischemic events. Heparin is frequently administered to treat acute coronary syndromes and during routine cardiac catheterization procedures. Because it stimulates lipolysis, it is a potential confounder of metabolomic analyses in these populations.

Methods: We evaluated the effect of heparin use on peripheral blood metabolic profiles obtained during cardiac catheterization using pre- and post-procedure sampling in 20 patients who received heparin and 10 control patients who did not. Using mass spectrometry and conventional immunoassays, we profiled 69 metabolites (acylcarnitines, amino acids, non-esterified fatty acids and their oxidation byproducts, and conventional lipids) in these samples. The difference between mean metabolite levels before and after the procedure was determined and compared between the no heparin and heparin groups.

Results: Clinical characteristics of the no heparin and heparin groups, indication for cardiac catheterization, procedure performed, and other periprocedural variables were similar. The mean changes in pre- and post-procedure beta-hydroxybutyrate (5.43 vs. 63.02 mmol/L; $u = 57.59$ mmol/L; $p = 0.01$), ketones (21.17 vs. 92.93 $\mu\text{mol/L}$; $u = 71.76$ $\mu\text{mol/L}$; $p = 0.01$), non-esterified fatty acids (0.37 vs. 1.14 mmol/L; $u = 0.78$ mmol/L; $p = 0.03$), and triglycerides (-9.33 vs. -34.95 mg/dL; $u = -25.61$ mg/dL; $p = 0.008$) were significantly different between the no heparin and heparin groups, respectively.

Conclusions: We showed that heparin use induces changes in peripheral blood metabolic profiles obtained during cardiac catheterization procedures and created a metabolomic signature associated with heparin administration. The metabolite changes are consistent with the known lipolytic effect of heparin. These findings are important to allow accurate assessment in future metabolomic studies in populations exposed to heparin.